

TWO NEW SPECIES OF *PETROVA* MOTHS FROM PINE
IN SOUTHEAST ASIA (TORTRICIDAE, OLETHREUTINAE)

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The genus *Petrova* is holarctic in distribution and its known hosts are conifers, pines in particular. The larvae are usually shoot borers. Forest entomological investigations in India and Thailand have revealed two previously unknown members of *Petrova* whose descriptions follow. One of them has adapted to an introduced North American pine in southeast Asia.

In this paper the letter *n* denotes number of specimens underlying an observation or conclusion. Color names accompanied by a parenthetical number indicate standard colors in the system of Kelly & Judd (1965).

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***Petrova khasiensis* Miller, new species**

Figs. 1a-c

Male. (2 n) *Head*: Labial palpus short, second segment $0.9\times$ eye diameter, apical segment $0.4\times$ length of second segment; scaling spreading, partly obscuring apical segment, orange brown, darker toward base. Scaling of front and crown lighter hued than labial palpus. *Thorax*: Dorsal scaling, including tegulum, shining brown, some scales white tipped. Venter and prothoracic and mesothoracic legs shining brown, metathoracic legs lighter, tibiae and tarsi white banded. *Forewing*: Length 7.0–8.5 mm, $2.6\times$ width; apex acute, termen slightly convex, tornal angle distinct. Upper side (Fig. 1a) with indistinct basal patch, shining gray from base to middle with sprinkling of strong brown, strong brown beyond middle except for four paired white marks on costa, which continue irregularly and intermittently to dorsum as silver and white bands and form a rudimentary ocellus; about 15 black scales sprinkled in ocellar area. Fringe gray, tinged with orange brown. Underside gray, mottled with white in costal area. *Hindwing*: Wider than forewing, termen concave, curved to dorsum, tornal angle not discernible. Shining gray throughout. Fringe pale gray. Underside gray, lighter than underside of forewing. *Abdomen*: Dorsal scaling shining light brown, ventral shining white. Genitalia (2 n) with valva moderately constricted, clasper a broad ridge (Fig. 1b); uncus slightly developed.

Female. (6 n) As described for male with following exceptions. *Forewing*: Length 8.0–9.5 mm, $2.4\times$ width. *Abdomen*: Genitalia (4 n) with sterigma a shield-like plate (Fig. 1c), a sclerotized incomplete ring near middle of ductus, two unequal sized thorn-like signa. Posterior apophyses shorter than anterior.

Types. *Holotype*, male (Fig. 1a) and *allotype*, female: Upper Shillong, Assam

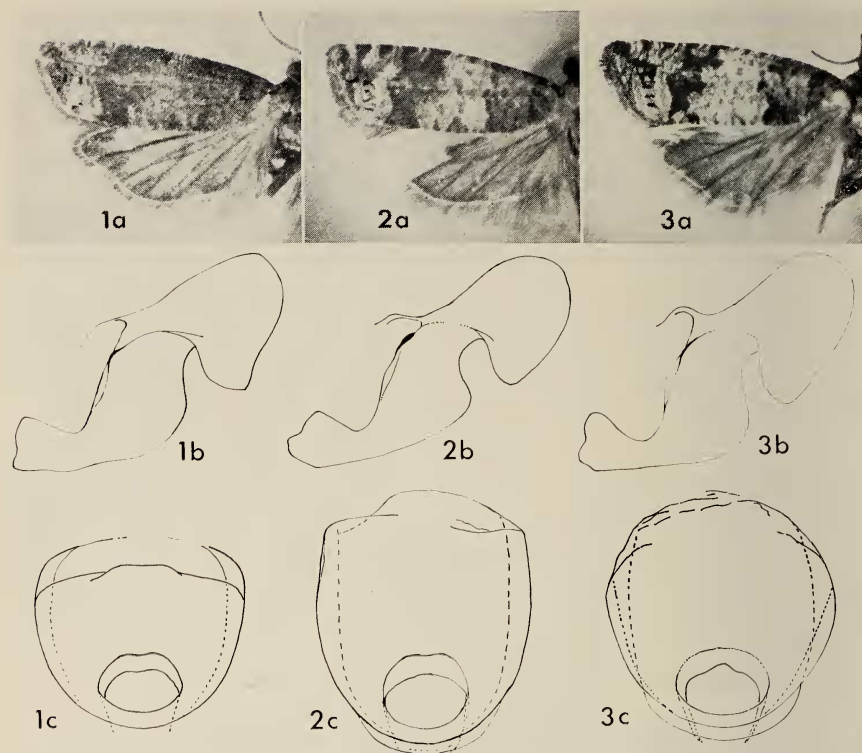


Fig. 1. *Petrova khasiensis*: a. holotype, male; b. male valva; c. female sterigma.
 Fig. 2. *Petrova salweenensis*: a. holotype, male; b. male valva; c. female sterigma.
 Fig. 3. *Petrova cristata*: a. female from near Kyoto, Japan, forewing length 8.0 mm; b. male valva; c. female sterigma.

(now Meghalaya), March 1963, CIBC, male genitalia slide 173 and female genitalia slide 170 (R. B. Moore) and wing slide II.24.76 (W. E. Miller), both types in US National Museum of Natural History. Two paratypes: same data as holotype except male genitalia slide 376301 (W. E. Miller) in US National Museum of Natural History, and female genitalia slide 412763 (W. E. Miller) in collection of CIBC Indian Station, Bangalore. Four additional females examined, one with same data as holotype, two with same except August 1968.

Host. *Pinus khasya* Royle.

Geographic distribution. Khasi Hills of northeastern India.

***Petrova salweenensis* Miller, new species**

Figs. 2a-c

Male. (4 n). As in *khasiensis* with following exceptions. *Thorax*: Dorsal scaling lighter and sprinkled with strong brown. *Forewing*: Length 6.0-7.5 mm; upper side (Fig. 2a) more heavily sprinkled with strong brown from base to middle, basal patch distinct. *Abdomen*: Genitalia (3 n) with valva greatly constricted (Fig. 2b), uncus moderately developed.

Female. (5 n). As described for male with following exceptions. *Forewing*: Length 6.0–8.5 mm. *Abdomen*: Genitalia (5 n) as in *khasiensis* except sterigma more elongate (Fig. 2c).

Types. *Holotype*, male (Fig. 2a): Baw Luang, Thailand, March 20, 1972, D. Chaiglom; *allotype*, female, Chiangmai, Thailand, March 10, 1975, Chavewan, female genitalia slide 22476a (W. E. Miller), both types in US National Museum of Natural History. Two paratypes: Baw Luang, Thailand, March 1976, Chavewan, male genitalia slide 376305, and female genitalia slide 376304 (W. E. Miller) in US National Museum and Thailand Royal Forest Department, Bangkok, respectively. Five additional specimens examined, two males and three females, same data as paratypes.

Hosts. *Pinus khasya*, *P. merkusii* De Vries, and *P. caribaea* Morelet, the last introduced from North America.

Geographic distribution. Northwestern Thailand.

DISCUSSION

The closest known occurrences of *Petrova khasiensis* and *P. salweenensis* to one another are 960 air km apart. Both species are similar to *P. cristata* (Walsingham) (Figs. 3a–c; illustrated by Issiki (1957) in color) whose nearest known occurrence is Canton, China (Obraztsov, 1964), 1,500 air km northeast of Chiangmai. Both new species were compared with *P. cristata* reared from *Pinus thunbergii* Parl. near Kyoto, Japan (5 n). The main anatomical differences are summarized as follows:

| Item | <i>khasiensis</i> | <i>salweenensis</i> | <i>cristata</i> |
|--------------------------------------|----------------------|----------------------|--------------------|
| Forewing (5–9 n): | | | |
| Length, mm | 7.0–9.5 | 6.0–8.5 | 6.0–8.0 |
| Ground color | Strong brown (55) | Strong brown (55) | Dark brown (59) |
| Basal patch | Obscure | Distinct | Distinct |
| Male genitalia (2–3 n): | | | |
| Ventral margin of valval sacculus | Obtuse angular | Right angular | Right angular |
| Valval constriction | Moderate | Great | Great |
| Uncus development | Slight | Moderate | Slight |
| Female genitalia (3–5 n): | | | |
| Width of sterigma | > Length | < Length | < Length |

Strong brown is much lighter than dark brown. Color and other anatomical differences between adult *Petrova khasiensis* and *P. salweenensis* are minor, but it is desirable for communication purposes to treat them as separate taxa unless future biological investigations prove them conspecific and reduce the weights of current diagnostic characters.

Pine biogeography suggests how *Petrova khasiensis* and *P. salweenensis* may have evolved. The two species appear to be isolated from one another by disjunct distribution of the shared host, *Pinus khasya* (variously spelled such as *kesiya* and considered by some authors to be *P. insularis*

Endl.). *Pinus khasya* does not occur at low elevations and there are 100-km gaps between its occurrences from the Khasi Hills of north-eastern India (range of *Petrova khasiensis*) to the highlands of Thailand (range of *P. salweenensis*) (Critchfield & Little, 1966; Mirov, 1967). *Pinus merkusii* and other pines likewise seem to be absent in these gaps. In Pleistocene times, the cool climate that allowed pines to migrate southward through Indochina (Mirov, 1967) must have allowed *P. khasya* to occur at low elevations, perhaps in continuous distribution. As the climate warmed at the end of the Pleistocene, *P. khasya* would have retreated from low elevations to form its fractured distribution pattern, thereby creating islands of *Petrova* that speciated. Under this hypothesis, related *Petrova* might occur in other subdivisions of the *Pinus khasya* range.

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A RECORD OF *URBANUS SIMPLICIUS* (HESPERIIDAE) FOR THE USA

Tilden (1965, J. Lepid. Soc. 19: 53-55) summarized the differences between *Urbanus simplicius* (Stoll) and *Urbanus procne* (Plotz). He found that most if not all records of *simplicius* from the USA were erroneous, a result of confusion of that species with *procne*.

I took a fresh male *simplicius* in Bentsen-Rio Grande Valley State Park, Hidalgo Co., Texas, on 13 April 1974. The specimen was collected at a large patch of thistle, *Cirsium texanum* Buckl. (Compositae), whose blossoms were attracting many skippers. Of the 35 species of HesperIIDae present, other interesting species were *Urbanus doryssus* Swainson, *Astraptus anaphus annetta* Evans, *Aguna asander* (Hewitson), *Cogia outis* (Skinner), and *C. hippalus* (Edwards). These are apparently the first records from the Lower Rio Grande Valley for the two *Cogia* species.

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